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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/721,128	Applicant(s) DIKE, BRUCE D.	
	Examiner John Juba, Jr.	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
4a) Of the above claim(s) 2-5, 7, 10, 16-25, 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 6, 8, 9, 12-15 and 26 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/25/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions – Main Groups

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1, 6, 8 – 15, and 26, drawn to a real image generator and broadband reflective polarizer, classified in class 359, subclass 485.
- II. Claims 17 - 19 drawn to a real image generator and matched bandwidth direct view light extinguisher, classified in class 359, subclass 494.
- III. Claims 22, 23 and 25, drawn to a real image generator and wide-view film, classified in class 349, subclass 117.
- IV. Claims 2 – 5, 7, 20, 27, and 28, drawn to a real image generator and broadband reflective polarizer combined with direct view light extinguisher, classified in class 359, subclass 485.
- V. Claims 16 and 24, drawn to a real image generator and broadband reflective polarizer, classified in class 349, subclass 117.
- VI. Claim 21, drawn to a real image generator and direct view light extinguisher combined with a wide view film, classified in class 349, subclass 117.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a front projection display. See MPEP § 806.05(d).

Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a front projection display. See MPEP § 806.05(d).

Inventions I and IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because claim 17 evidences that the combination of Group IV does not rely upon the details of the reflective polarizer recited in claim 1 of Group I. The subcombination has separate utility such as in a front projection display.

Inventions I and V are related as combination and subcombination. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because claim 22 evidences that the combination of Group V does not rely upon the details of the reflective polarizer recited in claim 1 of Group I. The subcombination has separate utility such as in a front projection display. See (MPEP § 806.05(c)).

Inventions I and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a front projection display. See MPEP § 806.05(d).

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as in a rear projection display. See MPEP § 806.05(d).

Inventions II and IV are related as combination and subcombination. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because claim 7 evidences that the combination of Group

IV does not rely upon the matched bandwidth details of the extinguisher recited in Group II. The subcombination has separate utility such as in a front projection display. See (MPEP § 806.05(c)).

Inventions II and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention V has separate utility such as in a rear projection display. See MPEP § 806.05(d).

Inventions II and VI are related as combination and subcombination. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because claim 22 evidences that the wide view film and reflective polarizer alone are separately patentable and thus that combination of Group VI does not rely upon the matched bandwidth details of the extinguisher recited in Group II. The subcombination has separate utility such as in a retinal projection display, whereas the combination has utility in a rear projection display. See (MPEP § 806.05(c)).

Inventions III and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as in a rear projection display, whereas the combination has disclosed utility in a retinal image projector. See MPEP § 806.05(d).

Inventions III and V are related as combination and subcombination. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because claim 1 evidences that the real image generator and broadband reflective polarizer alone are regarded as separately patentable, and thus that the combination of the broadband polarizer and wide view film Group VI does not rely upon wide view film for patentability. The subcombination has separate utility such as in a rear projection display, whereas the combination has disclosed utility in a retinal display. See (MPEP § 806.05(c)).

Inventions III and VI are related as combination and subcombination. In the instant case, the combination as claimed does not require the particulars of the

subcombination as claimed because claim 17 evidences that the matched bandwidth direct view light extinguisher is regarded as separately patentable, without the wide view film recited in the combination. The subcombination has separate utility such as in a retinal projection display, whereas the combination has utility in a rear projection display. See (MPEP § 806.05(c)).

Inventions IV and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention V has separate utility such as in a rear projection display. See MPEP § 806.05(d).

Inventions IV and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention VI has separate utility such as in a rear projection display. See MPEP § 806.05(d).

Inventions V and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention V has separate utility such as in a rear projection display. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, because the search for groups III, V, and VI is not required for groups I, II, and IV, and because the search for groups II, IV, and VI is not required for groups I, III, and V, restriction for examination purposes as indicated is proper.

Restriction - Species

It is noted that Group I contains claims directed to the following patentably distinct species of the claimed invention:

Species a – light converged by a lens, to which claim 10 appears to be directed;

Species b – light converged by a curved reflector, to which claim 12 appears to be directed.

If Applicant elects Group I, then Applicant is further required under 35 U.S.C. 121 to elect a single disclosed species within Group I for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 1 is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Restriction - Linking Claims

Claim 17 links inventions II and VI; Claim 22 links inventions III and V:

If Applicant elects either Group II or Group VI, claim 17 will be examined.

If Applicant elects either of Group III or Group V, claim 22 will be examined.

The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claims 17 or 22. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Restriction – Election by Telephone

During a telephone conversation with Mr. Morgan Heller on February 11, 2005, a provisional election was made with traverse to prosecute the invention of Group I, Species b, claims 1, 6, 8, 9, 11 – 15, and 26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 2 – 5, 7, 16 – 25, 27, and 28 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claim 10 is withdrawn from consideration as being drawn to a non-elected species, there being no allowable generic claim.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

An action on the elected invention follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 14, 15, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by N.V. PHILIPS' Gloelampenfabrieken Groenewoudseweg (EP 0 467 447 A1; hereinafter, "PHILIPS' G.G."). The elements of claim 26 will be addressed first. Referring *initially* to Figure 11 and the associated text (*esp.* Pg. 11, lines 13 – 15), PHILIPS disclose an optical system for projecting a real image, comprising:

- (a) at least one source (100) emitting source light;
- (b) an [illumination] optical system (54)(57)(63)(64) forming a real image (L'p/L's) from said source light, said optical system comprising:
 - (i) at least one converging element (63)(64) for converging a portion of said source light so as to form a real image; and
 - (ii) a broadband reflector-polarizer (20) located in an optical path between said at least one converging element and said real image and opposite said source.

It is clear from the discussion of the first class of polarizers (20) that PHILIPS' G.G. regard the polarizer as a broadband (total internal) reflector-polarizer (Pg. 8, lines 48 – 54). Although the converging elements appear to converge the entirety (substantially) of the source light, an element that converges the entirety can be regarded as

converging all of the portions. One of ordinary skill would regard an element that reflects light of only a single polarization state (such as element 20) as a "reflector-polarizer".

With regard to claims 14 and 15, the polarizer of PHILIPS' G.G. operates by total internal reflection, rather than by Brewster's angle. Thus, it is believed that nearly 100% of light of the first polarization state is reflected, while nearly 100% of light of the second polarization state is transmitted. Thus, the stand-alone efficiency of the polarizer is nearly 100%.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6, 8, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoppe (U.S. Patent number 5,715,023), or in the alternative, under 35 U.S.C. 103(a) as being unpatentable over Hoppe (5,715,023), in view of PHILIPS ELECTRONICS (EP 0 606 940 A2). Referring to Figure 2 and the associated text, Hoppe discloses an optical system that will form a real image from a collimated light source, comprising:

at least one converging element (205) that will converge a portion of the light source so as to form a real image *when* the optical system is in use to form such an image; and

a broadband reflector-polarizer (209)(211)(213) located in an optical path between said at least one converging element and the real image and opposite the source *when* the optical system is in use to form a real image.

The recitation that the optical system is "for forming a real image from source light" is not seen as distinguishing the recited structure over the structure of the prior art, since the prior art is *inherently* capable of forming a real image of a collimated light beam arriving from the right (in the figure). For clarification, the examiner has marked-up a copy of Hoppe's Figure 2 below (the dotted lines are the examiner's).

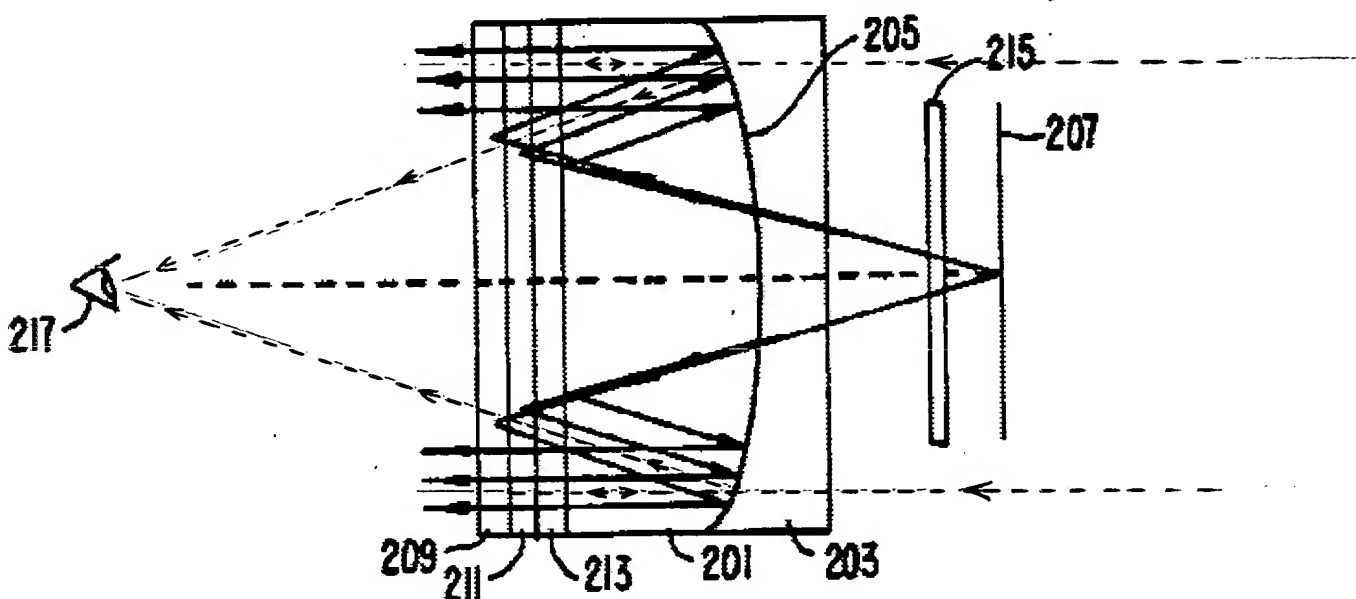


FIG. 2.

U.S. Patent number 5,715,023

Unlike the collimating embodiment, when the system is used to form a real image, the rays of different wavelengths will trace the same paths. The examiner believes that since Hoppe discloses the stack of cholesteric layers as providing multicolor or “wider bandwidth” operation (Col. 6, lines 3 – 5), one of ordinary skill would regard the collection of cholesteric layers as a “broadband” reflective polarizer, within the specificity recited. Thus, Hoppe is believed to anticipate the recited structure. However, if Hoppe does not anticipate a “broadband reflector-polarizer”, then in the same field of endeavor, PHILIPS ELECTRONICS teach that prior art broadband “polarizers” obtained by serially stacking a plurality of cholesteric layers having different band-pass characteristics suffer from several drawbacks including disclinations, loss of planar molecular order, and angular dependence stemming from requisite large thicknesses. In order to overcome these limitations, PHILIPS ELECTRONICS teach that a single cholesteric layer can be provided with a variable pitch so as to provide a broadband polarizing characteristic.

It would have been obvious to one of ordinary skill to employ a variable-pitch, broadband cholesteric layer in the polarizer of Hoppe, in the interest of providing a reflector-polarizer that overcomes the drawbacks associated with serially-stacked cholesteric layers, as taught by PHILIPS ELECTRONICS.

With regard to claims 6, 8, and 12, the converging element of Hoppe is a beam splitter (205) located between the source and the real image *when* the optical system is used to form a real image, as set forth above.

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Claims 1, 6, 8, 9, 12, 13, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka, et al (U.S. Patent number 5,853,240) in view of Hoppe (5,715,023) alone, or at least further in view of PHILIPS ELECTRONICS (EP 0 606 940 A2). Referring to the discussion of Figure 9, Tanaka^{et al} disclose the invention substantially as claimed, including the recited arrangement of source light from a source (3c), a converging element (41c), a cholesteric reflector-polarizer (13c), and a real image formed at (5). However, Tanaka, et al do not disclose the reflector-polarizer as a "broadband" reflector-polarizer, as recited.

In the same field of endeavor¹, Hoppe discloses an optical system comprising a converging element and cholesteric reflector-polarizer. Hoppe teaches that the display can be modified to provide a multicolored or broadband image by stacking cholesteric layers in the reflector-polarizer.

It would have been obvious to one of ordinary skill to stack a plurality of cholesteric layers in the reflector-polarizer (13c) of Tanaka, et al, in the interest of providing a multicolored or broadband image, as suggested by Hoppe. One of ordinary skill would have appreciated that the provision of a full-colored display would have offered greater marketability through greater consumer acceptance. The examiner believes that the stacked cholesteric layers, providing the "wider bandwidth" operation suggested by Hoppe (Col. 6, lines 3 – 5) fairly qualifies as a "broadband" reflector-polarizer. However, if such is not the case then the following applies.

Note 1. Tanaka, et al teach that their optical system (40c) is equally useful in a *virtual* image display arrangement, as discussed in connection with Figure 17, atop Column 13.

In the same field of endeavor, PHILIPS ELECTRONICS teach that prior art broadband “polarizers” obtained by serially stacking a plurality of cholesteric layers having different band-pass characteristics suffer from several drawbacks including disclinations, loss of planar molecular order, and angular dependence stemming from requisite large thicknesses. In order to overcome these limitations, PHILIPS ELECTRONICS teach that a single cholesteric layer can be provided with a variable pitch so as to provide a broadband polarizing characteristic.

In practicing the invention of Tanaka, et al, it would have been obvious to one of ordinary skill to employ a variable-pitch, broadband cholesteric layer in place of the multi-layered reflector-polarizer of suggested by Hoppe, in the interest of providing a reflector-polarizer that overcomes the drawbacks associated with serially-stacked cholesteric layers, as taught by PHILIPS ELECTRONICS.

With particular regard to claim 9, Tanaka, et al suggest integrating the polarizer-reflector (13c) on the plano surface of the converging element (41c) (Col. 10, lines 52 – 59). In such an embodiment, the converging element would “comprise” the broadband reflector-polarizer.

Claims 1, 13 – 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over PHILIPS’ G.G. (EP 0 467 447 A1), in view of M. Schadt, et al. (*SID 90 Dig.*), or at least over these two teachings further in view of PHILIPS ELECTRONICS (EP 0 606 940 A2).

Referring to Figure 5 and the associated text, PHILIPS' G.G. disclose an optical system for projecting a real image, comprising:

- (a) at least one source (not shown in Fig. 5) emitting source light;
- (b) an [illumination] optical system (not shown in Fig. 5) forming a real image (at plane 44) from said source light, said optical system comprising:
 - (i) at least one converging element (not shown) for converging a portion of said source light so as to form a real image; and
 - (ii) a reflector-polarizer (41) located in an optical path between said at least one converging element and said real image and opposite said source.

Although the light source and converging element are not shown in this particular figure, it is clear that the illustrated polarizer embodiment is to be used with these components in a manner similar to the other embodiments. A principal objective the PHILIPS' G.G. invention is to overcome the acceptance-angle and bandwidth limitations of prior art interference polarizers (Pg. 2, lines 31 – 41). Thus, PHILIPS' G.G. discloses the invention substantially as claimed. Further, while not disclosing specific details of the cholesteric reflector-polarizer of Figure 5, PHILIPS' G.G. do direct the reader to the disclosure of Schadt, et al, who are said to disclose the use of cholesteric materials with reflectors Pg. 3, lines 34 – 40).

In the same field of endeavor, Schadt, et al teach that the relatively narrow transmission band characteristics of cholesteric reflective polarizers can be overcome by serially arranging (stacking) several cholesteric layers having different passband

characteristics (see discussion of Figure 2). Schadt, et al teach that planar cholesteric filters (reflector-polarizers) with broad band-pass characteristics are a prerequisite for large contrast, high brightness displays (see "Conclusions").

It would have been obvious to one of ordinary skill to employ a serial stack of cholesteric filters in the reflector polarizer of PHILIPS' G.G., in the interest of overcoming the relatively narrow pass characteristics of conventional single-layer cholesteric polarizers, as suggested by Schadt, et al. It would appear that PHILIPS recognize this to be one way to provide a broadband reflector-polarizer.

The examiner believes that the serially-arranged cholesteric layers suggested by Schadt, et al fairly constitute a "broadband" reflector-polarizer within the specificity recited. However, if such is not the case, then, in the same field of endeavor, PHILIPS ELECTRONICS teach that prior art broadband "polarizers" obtained by serially stacking a plurality of cholesteric layers having different band-pass characteristics suffer from several drawbacks including disclinations, loss of planar molecular order, and angular dependence stemming from requisite large thicknesses. In order to overcome these limitations, PHILIPS ELECTRONICS teach that a single cholesteric layer can be provided with a variable pitch so as to provide a broadband polarizing characteristic.

It would have been obvious to one of ordinary skill to employ a variable-pitch, broadband cholesteric layer in the polarizer of PHILIPS' G.G., in the interest of providing a reflector-polarizer that overcomes the angular sensitivity and bandwidth limitations of prior art interference polarizers without the drawbacks associated with serially-stacked cholesteric layers, as taught by PHILIPS ELECTRONICS.

With particular regard to claims 14 and 15, the examiner believes the expression “transmissive/reflectance efficiency” to refer to the “stand alone” efficiency discussed in the specification. In light of the present specification, it appears that this efficiency is taken point-wise across the spectrum, rather than integrated. Thus, it is believed that the cholesteric reflector-polarizer of PHILIPS’ G.G. would be expected to have an efficiency of at least 90% at some wavelength. Further, PHILIPS ELECTRONICS teach that 80% conversion efficiency is readily attained using the broadband polarizers (Pg. 9, lines 20 – 27). Even if 90% transmissive/reflectance efficiency is not inherent in the structure suggested by the prior art, it is believed that one of ordinary skill would have found it obvious to manipulate the cholesteric layer until *ideally*, nearly 100% efficiency were attained, since it was well-known that higher efficiency presents numerous obvious advantages such as reduced power consumption and reduced heat generation.

Allowable Subject Matter

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or fairly suggest the elements arranged as recited, particularly wherein the converging element comprises the broadband reflector-polarizer in a cylindrical configuration, as recited in claim 11.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Swanson, et al (U.S. Patent Appl. Pub. no. 2001/0048493 A1) disclose a real image projector (Fig. 28) with a fluorescent back light and phase plate for generating a multi-colored array of illumination beams, in combination with a converging element and cholesteric reflector-polarizer (paras. [0164] – [0166]).

Ophey (U.S. Patent number 6,421,183) discloses a retinal image projector comprising a polarization selective reflector (DBEF film) in combination with achromatic quarter-wave plates (Col. 4, line 13), and teaches that the polarization selective reflector and at least one waveplate may be curved.

De Vaan, et al (U.S. Patent number 6,024,451) disclose an image projection apparatus comprising a broadband reflector-polarizer comprising a variable-pitch cholesteric layer (Col. 4, lines 15 – 30) and suggest conversion of circularly polarized light to linearly polarized light using a broadband or “achromatic” quarter-wave plate (Col. 5, lines 9 – 15, Col. 9, line 18). In column 9 (lines 3 – 5), this system is suggested as borrowing the two-plate integrating lenslets of PHILIPS' G.G. (EP 0 467 447 A1).

Holman, et al (U.S. Patent number 5,975,703) disclose image projectors employing broadband reflector-polarizers which may be the 3M DBEF film in linearly polarized embodiments or Merck TRANSMAX broadband cholesteric layers in circularly polarized embodiments (Col. 13, lines 22 – 58), the reflector-polarizers being used in

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combination with broadband polarization converting layers (Col. 14, lines 25 – 35), and teach use of the wideband cholesteric material both in the image path, and in the illumination path, the illumination path including embodiments wherein a real image is formed, and embodiments wherein the broadband cholesteric layer is used on a curved surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 – 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.


JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

February 14, 2005